

CLAIMS

We claim:

1. A method for synthesizing a molecular sieve, the method comprising the steps of: (a) forming a reaction mixture comprising: at least one templating agent and at least two of the group consisting of a silicon source, a phosphorous source and an aluminum source; (b) introducing to the reaction mixture a polymeric base; and (c) recovering the molecular sieve from the reaction mixture.
2. The method claim 1 wherein the polymeric base is a soluble polymeric base.
3. The method of claim 1 wherein the polymeric base is a polymeric imine.
4. The method of claim 1 wherein the polymeric base is represented by the formula:
$$(-\text{NHCH}_2\text{CH}_2-)_m[-\text{N}(\text{CH}_2\text{CH}_2\text{NH}_2)\text{CH}_2\text{CH}_2-]_n,$$
wherein m is from 10 to 20,000, and n is from 1 to 2,000.
5. The method claim 1 wherein the mole ratio of the monomeric unit of the polymeric base to the templating agent is less than 20.
6. The method of claim 1 wherein the reaction mixture is maintained at a pH in the range of from 3 to 10.
7. The method of claim 1 wherein the templating agent is a quaternary ammonium hydroxide or a quaternary ammonium salt.
8. The method of claim 1 wherein the polymeric base is selected from on the group consisting of: epichlorohydrin modified polyethylenimine,

ethoxylated polyethylenimine, polypropylenimine diamine dendrimers, poly(allylamine), poly(1,2-dihydro-2,2,4-trimethylquinoline), and poly(dimethylamine-co-epichlorohydrin-co-ethylenediamine).

- 5 9. The method of claim 1 wherein the reaction mixture comprises: at least one templating agent and a silicon source, a phosphorous source and an aluminum source.
- 10 10. The method of claim 1 wherein the reaction mixture comprises: at least one templating agent and a phosphorous source and an aluminum source.
- 15 11. A method for synthesizing a molecular sieve, the method comprising the steps of: (a) combining at least one templating agent and at least one of the group consisting of a silicon source, a phosphorous source and an aluminum source; and (b) adding a non-ionic polymeric base.
- 20 12. The method of claim 10 wherein the method further comprises the step of: (c) crystallizing the molecular sieve at a temperature less than 200°C.
- 25 13. The method of claim 11 wherein the non-ionic polymeric base is soluble.
- 30 14. The method of claim 11 wherein the non-ionic polymeric base is represented by the formula:

$$(-\text{NHCH}_2\text{CH}_2-)_m[-\text{N}(\text{CH}_2\text{CH}_2\text{NH}_2)\text{CH}_2\text{CH}_2-]_n,$$
 wherein m is from 10 to 20,000, and n is from 1 to 2,000.
- 35 15. The method claim 11 wherein the mole ratio of the monomeric unit of the non-ionic polymeric base to the templating agent is less than 20.
- 40 16. The method of claim 15 wherein the non-ionic polymeric base in an aqueous solution has a pH in the range of from 8 to 14.

17. The method of claim 11 wherein the templating agent is a quaternary ammonium hydroxide or a quaternary ammonium salt.
- 5 18. The method of claim 11 wherein the at least templating agent is combined with a silicon source, a phosphorous source and an aluminum source.
19. The method of claim 1 wherein the non-ionic polymeric base is a polymeric imine.
- 10 20. A molecular sieve catalyst composition comprising, in combination, at least one templating agent, at least one of the group consisting of a silicon source, a phosphorous source and an aluminum source, and a polymeric base.
- 15 21. The molecular sieve catalyst composition of claim 20, wherein the molecular sieve catalyst composition is dried.
- 20 22. The molecular sieve catalyst composition of claim 20 wherein the molecular sieve catalyst composition comprises of a silicon source, a phosphorous source and an aluminum source.
- 25 23. A method for forming a molecular sieve catalyst composition from the molecular sieve recovered in step (c) of claim 1, wherein the method further comprises the step of: contacting the molecular sieve with a matrix material, optionally with a binder.
- 30 24. The method of claim 23 wherein the molecular sieve recovered is a SAPO molecular sieve.

25. The method of claim 23 wherein the molecular sieve recovered is an ALPO molecular sieve.
- 5 26. The method of claim 23 wherein the molecular sieve catalyst composition is spray dried.
27. A process for producing one or more olefin(s), the process comprising the steps of:
- 10 (a) introducing a feedstock to a reactor system in the presence of the molecular sieve of claim 1;
- (b) withdrawing from the reactor system an effluent stream;
- and
- (c) passing the effluent gas through a recovery system recovering at least the one or more olefin(s) .
- 15 28. The process of claim 23 wherein the process further comprises the step of:
- (d) introducing the molecular sieve to a regeneration system to form a regenerated molecular sieve, and introducing the regenerated molecular sieve to the reaction system.
- 20 29. An integrated process for making one or more olefin(s), the integrated process comprising the steps of:
- (a) passing a hydrocarbon feedstock to a syngas production zone to producing a synthesis gas stream;
- 25 (b) contacting the synthesis gas stream with a catalyst to form an oxygenated feedstock; and
- (c) converting the oxygenated feedstock in the presence of the molecular sieve of claim 1 into the one or more olefin(s).

30. The process of claim 29 wherein the process further comprises the step of
(e) polymerizing the one or more olefin(s) in the presence of a
polymerization catalyst into a polyolefin.